



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,412	09/18/2003	Karin Schlicht	335.7697USU	4389

7590 03/22/2005

Paul D. Greeley, Esq.
Ohlandt, Greeley, Ruggiero & Perle, L.L.P.
One Landmark Square, 10th Floor
Stamford, CT 06901-2682

EXAMINER

DUDA, KATHLEEN

ART UNIT	PAPER NUMBER
----------	--------------

1756

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

BN
Application No.

10/665,412

14
Applicant(s)

SCHLICHT ET AL.

Examiner

Kathleen Duda

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-68 are pending in this application.
2. The 1.131 declaration has been found to be persuasive in antedating the Rutter publication and removing the art rejections using that reference.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeon (US Patent 6,159,646) in view of Yamamoto (US Patent 5,964,951) and Namiki (US Patent 6,200,724).

Jeon teaches conventional rework steps (fig.5D, 6-8) and organic solvents (col.3; lines.16-39). The process involves removing the resist layer using a mixture which includes ethyl lactate (claims 1 and 2).

Yamamoto teaches a stripping solution (2; 9-16) for removing resists from wafers. The steps include forming an antireflective underlayer (ARC) on a substrate, coating a photoresist and patterning the resist. The stripper

Art Unit: 1756

may also be used for edge-bead removal (unexposed areas. 4; 27-5; 5). Chemically amplified positive and negative tone resists may be stripped (3; 11-25). The organic solvents in the stripper are conventional and cover the instant specified compounds (2; 45-58).

Namiki teaches a CA-photoresist containing Si (6; 43-60) and a novel dissolution inhibitor. Namiki teaches that the resist is a conventional negative tone resist wherein the unexposed areas may be dissolved by an organic solvent (18; 60-65). The solvent would be useful in stripping the resist – this is well known in the art.

Jeon does not discuss Si-bearing resists. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Namiki's Si-bearing resist with improved-dissolution inhibitor in Jeon's process because the novel resist is easily soluble in conventional organic solvents including ethyl-lactate used by Jeon and in addition provides fine patterns with high resolution (29; 58-30; 14)

Namiki teaches a CA-photoresist containing Si (6; 43-60) and a novel dissolution inhibitor. Namiki teaches that the resist is a conventional positive tone resist wherein the exposed areas are developed in a developer and the *unexposed* areas may be dissolved by an organic solvent (18; 60-65). The solvent would be useful in stripping the resist – this is well known in the art.

Yamamoto does not discuss Si-bearing resists. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Namiki's Si-bearing resist with improved-dissolution inhibitor in Yamamoto's process because the novel resist is easily soluble in conventional organic solvents listed by Yamamoto and in addition provides fine patterns with high resolution (29; 58-30; 14).

Applicant argues that Jeon teaches complete removal of the photoresist. This argument is not clear since it appears that the complete removal of the imaging layer is recited in the claims of the present invention.

Applicant argues that Jeon does not teach the removal of a resist comprising silicon. This is not a claimed embodiment in the body of the claim. Jeon teaches, "selectively removing any photoresist" (column 3, lines 51-56) and Namiki teaches silicon-containing resist which are used in conventional processing which includes removal at some point in the process. Yamamoto also teaches the use of chemically amplified resists which can contain silicon as taught by Namiki.

Applicant argues that the prior art does not teach the removal of the layer without significant damage to the underlying layers. This is not a claimed embodiment. But this argument would not be found to be persuasive even if the embodiment was incorporated into the claims because Jeon teaches a rework process. A rework process involves removal of the photoresist with application of another photoresist layer before the processing continues. If the layer underneath Jeon were damaged by the removal, rework could not continue.


Column 14 teaches that the rework process can be used on all kinds of layers that have been applied to a semiconductor substrate.

Conclusion

5. Any inquiry concerning this communication should be directed to Examiner K. Duda at (571) 272-1383. Official FAX communications should be sent to (703) 872-9306.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff, can be reached at 571-272-1385.

Information regarding the status of an application may be obtained from the Patent Application Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Kathleen Duda
Primary Examiner
Art Unit 1756

3/18/05